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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/034,689
Filing Date: December 28, 2001
Appellant(s): SATISH JAMADAGNI, NANJUNDA SWAMY

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Technology Center 2100

David D'Zurilla
(Reg. No. 36,776)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed December 27, 2006 appealing from the Office action mailed December 13, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

The present application was filed on December 28, 2001 with claims 1-63. A non-final Office Action mailed April 22, 2005, rejected all the claims. In response filed on October 24, 2005, claims 6, 10, 27, 30, 37, 46, 50, and 58 were amended. A Final Office Action (hereinafter "the Final Office Action") was mailed December 13, 2005. Claims 1 and 22 were amended in a response dated February 13, 2006, however, the amendment was not entered. Claims 1-63 stand finally rejected, remain pending, and are the subject of the present Appeal.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

Ndousse et al, "Computational Intelligence for Distributed Fault Management in Networks Using Fuzzy Cognitive Maps", Communications, 1996, ICC 96, Conf Record, Converging Tech for Tomorrow's Appli. 1996 IEEE Intl Conf on, vol. 3, 23-27 June 1996, pages 1558-1562.

Zhi-Qiang Liu et al, "Contextual Fuzzy Cognitive Map for Decision Support in Geographic Information Systems", Fuzzy Systems, IEEE Transactions on, vol. 7, issue 5, Oct. 1999, pages 495-507.

Thierry Marchant, "Cognitive Maps and Fuzzy Implications", European Journal of Operational Research, vol. 114, issue 3, 1 May 1999, pages 626-637.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

CLAIM REJECTIONS - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims **1-18, 22-31, 33-39, 41-58, and 62-63** are rejected under 35 U.S.C. 102(b) as being anticipated by "Computational Intelligence for Distributed Fault Management in Networks Using Fuzzy Cognitive Maps", by Ndousse et al, hereinafter Ndousse.

Claim 1

Ndousse teaches a method to diagnose a problem from multiple events in a system of managed components generating real-time events of problems, comprising:

forming fuzzy cognitive maps (*FCMs, see e.g., abstract or Fig. 2*) including causally equivalent FCM fragments (*FCMs inherently comprise of fragments comprising of one or more nodes*) using network element interdependencies derived from a

database defining the network managed objects and event notifications that convey the state of one or more managed objects *(title, abstract, page 1559, left col., line 26, lines 29-30, lines 36-37, page 1558, right col., lines 1-6, last 3 lines)*;

sampling generated incoming real-time (*not further defined*) events from the system (*see e.g., time varying aspects, abstract; fault management, rapid solution, and/or very rapid detection, page 1558, left col., lines 5-36, paragraph I, lines 2-3*); and

diagnosing problems by mapping the sampled events to the formed FCM fragments (*page 1558, left col., lines 1-36*).

Claim 2

Ndousse teaches the method of claim 1, wherein forming the FCM fragments comprises:

determining event nodes (*event nodes simply read on literal events; in a network management or fault management system, an event can be a notification that something is wrong or that some type of failure occurred, see e.g., fault propagation, pgs. 1558-1559*) from events in the database (*page 1558, right col., especially last 4 lines; page 1559, left col., especially lines 41-42; page 1560 and the paragraph under Figure 5*);

identifying concept nodes (*concepts, pg. 1559, lines 34-41 read on decision points in the FCM, Fig. 2; see also concept nodes, under Fig. 5, pg. 1560*) from the determined event nodes (see how the concepts are determined from the actual events of a fault occurring, see "Models of Fault Propagation, *pgs. 1559-1560, especially pg. 1559, left col., lines 41-42, or pg. 1560, paragraph under Figure 5*); and

forming FCM fragments (*one or more nodes of an FCM*) including interdependencies (*clearly the concept node depend on events/faults actually occurring or modeling of a hypothetical situation where faults occur*) between the concept and event nodes using the determined event nodes and the identified concept nodes (*page 1559, left col., lines 41-42, page 1560, paragraph under Figure 5*).

Claim 3

Ndousse teaches the method of claim 2, wherein diagnosing the sampled events comprises:

mapping the sampled real-time events to the formed FCM fragments including determined event nodes to evaluate the effect of the mapped event nodes on the identified concept nodes using the determined interdependencies (*page 1559, Figure 2*);

identifying the problems by analyzing the concept nodes based on the outcome of the evaluation (*e.g., pgs. 1558-1561, especially pg. 1559, Figure 2*); and

diagnosing the problems based on the outcome of the analysis (e.g., *page 1559, Figure 2*).

Claim 4

Ndousse teaches the method of claim 3, wherein the system comprises:

a system selected from the group consisting of explicit system, implicit system, centralized system, partially centralized system, and distributed system (*see e.g., page 1558, or title*).

Claim 5

Ndousse teaches the method of claim 3, wherein the events comprise:

exceptional conditions occurring in the operation of the network (*e.g., routers failing, links/transmission lines failing, page 1558, left col., lines 32-33*).

Claim 6

Ndousse teaches the method of claim 5, wherein the event nodes comprise:

significant events selected from the group consisting of hardware failures (*e.g., a router/link*), software failures (*e.g., a protocol*), performance bottlenecks (*e.g., congestion, e.g., Figs. 2-5*), configuration problems (*e.g., links failing*) , and security violations (*links being broken or becoming unsecured, page 1558, left col., lines 32-33*).

Claim 7

Ndousse teaches the method of claim 6, wherein determining the event nodes comprises:

determining the event nodes from a database defining the network managed objects and event notifications that convey the state of one or more managed objects. (*Examiner interprets the database as Management Information Base. Official notice is taken that a Management Information Base (MIB) is a set of objects that represents various types of information about a device, used by a network management protocol to manage the device*).

Claim 8

Ndousse teaches the method of claim 7, wherein determining the event nodes further comprises:

determining the event nodes from expert knowledge (*not further defined*) of the network (*page 1559, left col., lines 1-3*).

Claim 9

Ndousse teaches the method of claim 8, wherein the managed objects comprise:

objects selected from the group consisting of network objects, attached systems, and application objects (*page 1558, right col., line 10*).

Claim 10

Ndousse teaches the method of claim 8, wherein the database comprises:

static information associated with each class of managed or dynamic information that affects the causal propagation of events (*page 1558, right col., last 2 lines*). (*Examiner interprets the database as Management Information Base. Official notice is taken that a Management Information Base (MIB) is a set of objects that represents various types of information about a device, used by a network management protocol to manage the device*).

Claim 11

Ndousse teaches the method of claim 3, wherein sampling the incoming real-time events comprises:

sampling the incoming real-time (not further defined) events sequentially in the order they are received (*page 1558, left col., lines 5-36, paragraph I, lines 2-3*).

Claim 12

Ndousse teaches the method of claim 3, wherein identifying the concept nodes comprises:

identifying a composite set of events that capture the notion of an abstract exception condition in the network (*e.g., page 1560, Figure 5*).

Claim 13

Ndousse teaches the method of claim 12, wherein the abstract exception condition comprises:

abstract exception conditions selected from the group consisting of a notion of fault and a notion of performance degradation, a network card in a communication system being faulty with the number of users being served by the communication system drastically reducing, and link between two routers going down leading to the use of alternate paths which lead to congestion and performance (*pgs. 1558-1561, especially page 1561, left col., lines 10-11, 14, right col., lines 1-3*).

Claim 14

Ndousse teaches the method of claim 12, wherein capturing (*e.g., collecting, polling, or determining)* the abstract exception condition comprises:

capturing normal paths based on predetermined criteria on which the events have to be diagnosed (*page 1558, left col., lines 6-13*).

Claim 15

Ndousse teaches the method of claim 14, wherein the criteria comprises:

causal and temporal inconsistencies between events (*page 1558, left col., lines 6-13*).

Claim 16

Ndousse teaches the method of claim 1, wherein forming the FCM, comprises:

capturing system event interdependencies (*page 1559, left col., lines 36-40*).

Claim 17

Ndousse teaches the method of claim 15, wherein capturing the system event interdependencies comprises:

interconnecting event and concept nodes using interdependency arcs capturing temporal and logical dependencies (*page 1559, left col., lines 36-40*).

Claim 18

Ndousse teaches the method of claim 17, wherein the interdependency arcs comprise:

weights based on temporal and logical dependencies (*page 1559, left col., lines 42-45*).

Claim 22

Ndousse teaches a method for diagnosing problems from multiple events in a communication network including managed components generating real-time events of problems, comprising:

forming fuzzy cognitive maps (*FCMs, see e.g., abstract or Fig. 2*) including causally equivalent FCM fragments (FCMs inherently comprise of fragments comprising of one or more nodes) using network element interdependencies (*page 1559, left col., line 26, lines 29-30, lines 36-37, page 1558, right col., lines 1-6, last 3 lines*);

sampling generated incoming real-time (*not further defined*) events from the network (*see e.g., time varying aspects, abstract; fault management, rapid solution, and/or very rapid detection, page 1558, left col., lines 5-36, paragraph I, lines 2-3*); and

diagnosing each of the generated problems by mapping the received sampled events to the formed FCM fragments (*page 1558, left col., lines 1-36*).

Claim 23

Ndousse teaches the method of claim 22, wherein forming the FCM fragments comprises:

determining event nodes (*event nodes simply read on literal events; in a network management or fault management system, an event can be a notification that something is wrong or that some type of failure occurred, see e.g., fault propagation, pgs. 1558-1559*) from events in the database (*page 1558, right col., especially last 4 lines; page 1559, left col., especially lines 41-42; page 1560 and the paragraph under Figure 5*);

identifying concept nodes (*concepts, pg. 1559, lines 34-41 read on decision points in the FCM, Fig. 2; see also concept nodes, under Fig. 5, pg. 1560*) from the determined event nodes (*see how the concepts are determined from the actual events of a fault occurring, see "Models of Fault Propagation, pgs. 1559-1560, especially pg. 1559, left col., lines 41-42, or pg. 1560, paragraph under Figure 5*); and

forming FCM fragments (*one or more nodes of an FCM*) including interdependencies (*clearly the concept node depend on events/faults actually occurring or modeling of a hypothetical situation where faults occur*) between the concept and event nodes using the determined event nodes and the identified concept nodes (*page 1559, left col., lines 41-42, page 1560, paragraph under Figure 5*).

Claim 24

Ndousse teaches the method of claim 23, wherein diagnosing the sampled events comprises:

mapping the sampled real-time events to the formed FCM fragments including determined event nodes to evaluate the effect of the mapped event nodes on the identified concept nodes using the determined interdependencies (*page 1559, Figure 2*);

identifying the problems by analyzing the concept nodes based on the outcome of the evaluation (*e.g., pgs. 1558-1561, especially pg. 1559, Figure 2*); and

diagnosing the problems based on the outcome of the analysis (*e.g., page 1559, Figure 2*).

Claim 25

Ndousse teaches a computer readable medium having computer-executable instructions to diagnose problems from multiple events in a system of managed components generating real-time events of problems, comprising (*page 1562, right col., lines 18-21*):

forming fuzzy cognitive maps (*FCMs, see e.g., abstract or Fig. 2*) including causally equivalent FCM fragments (*FCMs inherently comprise of fragments comprising of one or more nodes*) using network element interdependencies derived from a database defining the network managed objects and event notifications that convey the state of one or more managed objects *(title, abstract, page 1559, left col., line 26, lines 29-30, lines 36-37, page 1558, right col., lines 1-6, last 3 lines*);

sampling generated incoming real-time (*not further defined*) events from the system (*see e.g., time varying aspects, abstract; fault management, rapid solution, and/or very rapid detection, page 1558, left col., lines 5-36, paragraph I, lines 2-3*); and

diagnosing problems by mapping the sampled events to the formed FCM fragments (*page 1558, left col., lines 1-36*).

Claim 26

Ndousse teaches the computer readable medium of claim 25, wherein forming the FCM fragments comprises:

determining event nodes (*event nodes simply read on literal events; in a network management or fault management system, an event can be a notification that something is wrong or that some type of failure occurred, see e.g., fault propagation, pgs. 1558-1559*) from events in the database (*page 1558, right col., especially last 4 lines; page 1559, left col., especially lines 41-42; page 1560 and the paragraph under Figure 5*);

identifying concept nodes (*concepts, pg. 1559, lines 34-41 read on decision points in the FCM, Fig. 2; see also concept nodes, under Fig. 5, pg. 1560*) from the determined event nodes (*see how the concepts are determined from the actual events of a fault occurring, see "Models of Fault Propagation, pgs. 1559-1560, especially pg. 1559, left col., lines 41-42, or pg. 1560, paragraph under Figure 5*); and

forming FCM fragments (*one or more nodes of an FCM*) including interdependencies (*clearly the concept node depend on events/faults actually occurring or modeling of a hypothetical situation where faults occur*) between the concept and

event nodes using the determined event nodes and the identified concept nodes (*page 1559, left col., lines 41-42, page 1560, paragraph under Figure 5*).

Claim 27

Ndousse teaches the computer readable medium of claim 26, wherein diagnosing the sampled events comprises:

mapping the sampled real-time events to the formed FCM fragments including determined event nodes to evaluate the effect of the mapped event nodes on the identified concept nodes using the determined interdependencies (*page 1559, Figure 2*);

identifying the problems by analyzing the concept nodes based on activation levels of the concept nodes (*e.g., pgs. 1558-1561, especially pg. 1559, Figure 2*); and

diagnosing the problems based on the outcome of the analysis (*e.g., page 1559, Figure 2*).

Claim 28

Ndousse teaches the computer readable medium of claim 27, wherein the system comprises:

a system selected from the group consisting of explicit system, implicit system, centralized system, partially centralized system, and distributed system (*see e.g., page 1558, or title*).

Claim 29

Ndousse teaches the computer readable medium of claim 28, wherein the events comprise:

exceptional conditions occurring in the operation of the network (*e.g., routers failing, links/transmission lines failing, page 1558, left col., lines 32-33*).

Claim 30

Ndousse teaches the computer readable medium of claim 29, wherein the event nodes comprise:

significant events selected from the group consisting of hardware failures (*e.g., a router/link*), software failures (*e.g., a protocol*), performance bottlenecks (*e.g., congestion, e.g., Figs. 2-5*), configuration problems (*e.g., links failing*) , and security violations (*links being broken or becoming unsecured, page 1558, left col., lines 32-33*).

Claim 31

Ndousse teaches the computer readable medium of claim 27, wherein identifying the concept nodes comprises:

identifying a composite set of events that capture the notion of an abstract exception condition in the network (*page 1560, Figure 5*).

Claim 33

Ndousse teaches a computer system to diagnose problems from multiple events in a system of managed components generating real-time events of problems, comprising:

a storage device;

an output device; and

a processor programmed to repeatedly perform a method, comprising *(page 1562, right col., lines 18-21). (Software is run on a computer system. Official notice is taken that a computer comprises a storage device, an output device, and a processor)*:

forming fuzzy cognitive maps (*FCMs, see e.g., abstract or Fig. 2*) including causally equivalent FCM fragments (*FCMs inherently comprise of fragments comprising of one or more nodes*) using network element interdependencies derived from a database defining the network managed objects and event notifications that convey the state of one or more managed objects *(title, abstract, page 1559, left col., line 26, lines 29-30, lines 36-37, page 1558, right col., lines 1-6, last 3 lines*);

sampling generated incoming real-time (*not further defined*) events from the system (see e.g., time varying aspects, abstract; fault management, rapid solution, and/or very rapid detection, *page 1558, left col., lines 5-36, paragraph I, lines 2-3*); and

diagnosing problems by mapping the sampled events to the formed FCM fragments (*page 1558, left col., lines 1-36*).

Claim 34

Ndousse teaches the system of claim 33, wherein forming the FCM fragments comprises:

determining event nodes (*event nodes simply read on literal events; in a network management or fault management system, an event can be a notification that something is wrong or that some type of failure occurred, see e.g., fault propagation, pgs. 1558-1559*) from events in the database (*page 1558, right col., especially last 4*

lines; page 1559, left col., especially lines 41-42; page 1560 and the paragraph under Figure 5);

identifying concept nodes (*concepts, pg. 1559, lines 34-41 read on decision points in the FCM, Fig. 2; see also concept nodes, under Fig. 5, pg. 1560*) from the determined event nodes (*see how the concepts are determined from the actual events of a fault occurring, see "Models of Fault Propagation, pgs. 1559-1599, especially pg. 1559, left col., lines 41-42, or pg. 1560, paragraph under Figure 5*); and

forming FCM fragments (*one or more nodes of an FCM*) including interdependencies (*clearly the concept node depend on events/faults actually occurring or modeling of a hypothetical situation where faults occur*) between the concept and event nodes using the determined event nodes and the identified concept nodes (*page 1559, left col., lines 41-42, page 1560, paragraph under Figure 5*).

<u>Claim 35</u>

Ndousse teaches the system of claim 34, wherein diagnosing the sampled events comprises:

mapping the sampled real-time events to the formed FCM fragments including determined event nodes to evaluate the effect of the mapped event nodes on the identified concept nodes using the determined interdependencies (*page 1559, Figure 2*);

identifying the problems by analyzing the concept nodes based on the outcome of the evaluation (*e.g., pgs. 1558-1561, especially pg. 1559, Figure 2*); and

diagnosing the problems based on the outcome of the analysis (*e.g., page 1559, Figure 2*).

Claim 36

Ndousse teaches the system of claim 35, wherein the events comprise:

exceptional conditions occurring in the operation of the network (*e.g., routers failing, links/transmission lines failing, page 1558, left col., lines 32-33*).

Claim 37

Ndousse teaches the system of claim 35, wherein the event nodes comprise:

significant events selected from the group consisting of hardware failures (*e.g., a router/link*), software failures (*e.g., a protocol*), performance bottlenecks (*e.g., congestion, e.g., Figs. 2-5*), configuration problems (*e.g., links failing*) , and security violations (*links being broken or becoming unsecured, page 1558, left col., lines 32-33*).

Claim 38

Ndousse teaches the system of claim 35, wherein identifying the concept nodes comprises:

identifying a composite set of events that capture the notion of an abstract exception condition in the network (*page 1560, Figure 5*).

Claim 39

Ndousse teaches the system of claim 35, wherein forming the FCM, comprises:

capturing system event interdependencies by interconnecting event and concept nodes using interdependency arcs that capture temporal and logical dependencies (*page 1559, left col., lines 36-40*).

Claim 41

Ndousse teaches an event-correlation system to diagnose problems from multiple incoming real-time events in a communication network of managed components generating real-time events of problems, comprising:

an event-analyzer to form fuzzy cognitive maps (*FCMs, see e.g., abstract or Fig. 2*) fragments (*FCMs inherently comprise of fragments comprising of one or more nodes*) using network element interdependencies derived from a database defining the network managed objects and event notifications that convey the state of one or more managed objects *(title, abstract, page 1559, left col., line 26, lines 29-30, lines 36-37, page 1558, right col., lines 1-6, last 3 lines*); and

an event-processing module coupled to the event-analyzer to sample generated incoming real-time (*not further defined*) events from the network (see e.g., time varying aspects, abstract; fault management, rapid solution, and/or very rapid detection, *page 1558, left col., lines 5-36, paragraph I, lines 2-3*), wherein the analyzer to diagnose the problems from the sampled events by mapping the sampled events to the formed FCM fragments (*page 1558, left col., lines 1-36*).

Claim 42

Ndousse teaches the event-correlation system of claim 41, wherein the analyzer forms FCM fragments by determining event nodes (*event nodes simply read on literal events; in a network management or fault management system, an event can be a notification that something is wrong or that some type of failure occurred, see e.g., fault propagation, pgs. 1558-1559*) from events in the database (*page 1558, right col.,*

especially last 4 lines; page 1559, left col., especially lines 41-42; page 1560 and the paragraph under Figure 5), and by further identifying concept nodes (*concepts, pg. 1559, lines 34-41 read on decision points in the FCM, Fig. 2; see also concept nodes, under Fig. 5, pg. 1560*) from the determined event nodes (*see how the concepts are determined from the actual events of a fault occurring, see "Models of Fault Propagation, pgs. 1559-1599, especially pg. 1559, left col., lines 41-42, or pg. 1560, paragraph under Figure 5*) to form FCM fragments (*one or more nodes of an FCM*) including interdependencies (*clearly the concept node depend on events/faults actually occurring or modeling of a hypothetical situation where faults occur*) between the identified concept nodes and the determined event nodes (*page 1559, left col., lines 41-42, page 1560, paragraph under Figure 5*).

Claim 43

Ndousse teaches the event-correlation system of claim 41, wherein the analyzer further maps the sampled events to the formed FCM fragments including determined event nodes to evaluate the effect of the mapped events on the determined concept nodes using the determined interdependencies (*page 1559, Figure 2*), wherein the analyzer identifies the problems by analyzing the concept nodes based on the outcome of the evaluation (*e.g., pgs. 1558-1561, especially pg. 1559, Figure 2*) and further diagnoses the problems based on the outcome of the analysis (*e.g., page 1559, Figure 2*).

Claim 44

Ndousse teaches the event-correlation system of claim 43, wherein the communication network comprises:

a system selected from the group consisting of explicit system, implicit system, centralized system, partially centralized system, and distributed system (*see e.g., page 1558, or title*).

Claim 45

Ndousse teaches the event-correlation system of claim 43, wherein the events comprise:

exceptional conditions occurring in the operation of the network (e.g., routers failing, links/transmission lines failing, *page 1558, left col., lines 32-33*).

Claim 46

Ndousse teaches the event-correlation system of claim 45, wherein the event nodes comprise:

significant events selected from the group consisting of hardware failures (e.g., a router/link), software failures (e.g., a protocol), performance bottlenecks (e.g., congestion, e.g., Figs. 2-5), configuration problems (e.g., links failing) , and security violations (links being broken or becoming unsecured, *page 1558, left col., lines 32-33*).

Claim 47

Ndousse teaches the event-correlation system of claim 46, wherein the analyzer determines the event nodes from a database defining the network managed-objects and event notifications that convey the state of one or more managed objects. (*Examiner interprets the database as Management Information Base. Official notice is taken that a*

Management Information Base (MIB) is a set of objects that represents various types of information about a device, used by a network management protocol to manage the device).

Claim 48

Ndousse teaches the event-correlation system of claim 47, wherein the analyzer determines the event nodes from expert knowledge (*not further defined*) of the network (*page 1559, left col., lines 1-3*).

Claim 49

Ndousse teaches the event-correlation system of claim 48, wherein the managed objects comprise:

objects selected from the group consisting of network objects, attached systems, and application objects (*page 1558, right col., line 10*).

Claim 50

Ndousse teaches the event-correlation system of claim 48, wherein the database comprises:

static information associated with each class of managed objects or dynamic information that affects the casual propagation of events *(page 1558, right col., last 2 lines).* (*Examiner interprets the database as Management Information Base. Official notice is taken that a Management Information Base (MIB) is a set of objects that represents various types of information about a device, used by a network management protocol to manage the device*).

Claim 51

Ndousse teaches the event-correlation system of claim 43, further comprising:

a communication interface module coupled between the network and the event-processing module to extract events from real-time messages received in different formats from the network and to further sample the extracted events sequentially in the order they are received (*page 1558, left col., lines 5-8, paragraph I, lines 2-3*).

Claim 52

Ndousse teaches the event-correlation system of claim 43, wherein the analyzer identifying the concept nodes comprises a composite set of events that capture a notion of an abstract exception condition in the network (*e.g., page 1560, Figure 5*).

Claim 53

Ndousse teaches the event-correlation system of claim 52, wherein the abstract exception condition comprises conditions selected from the group consisting of a notion of fault and a notion of performance degradation (*pgs. 1558-1561, especially page 1561, left col., lines 10-11, 14, right col., lines 1-3*).

Claim 54

Ndousse teaches the event-correlation system of claim 52, wherein the analyzer captures (*e.g., collecting, polling, or determining*) the abstract exception condition by capturing normal paths based on predetermined criteria from which for the events are diagnosed (*page 1558, left col., lines 6-10*).

Claim 55

Ndousse teaches the event-correlation system of claim 54, wherein the criteria comprises:

causal and temporal inconsistencies between events (*page 1558, left col., lines 6-13*).

Claim 56

Ndousse teaches the event-correlation system of claim 43, wherein the analyzer forms FCM by capturing system event interdependencies (*page 1559, left col., lines 36-40*).

Claim 57

Ndousse teaches the event-correlation system of claim 56, wherein the analyzer captures system interdependencies by interconnecting event and concept nodes using interdependency arcs to capture temporal and logical dependencies (*page 1559, left col., lines 36-40*).

Claim 58

Ndousse teaches the event-correlation system of claim 57, wherein the interdependency arcs comprise:

weights based on temporal and logical dependencies (*page 1559, left col., lines 42-45*).

Claim 62

Ndousse teaches the event-correlation system of claim 43, further comprising:

an interface output module coupled to the event-analyzer to output one or more solutions based on the outcome of diagnosing the problems by the analyzer *(page 1562, right col., lines 18-21). Software is run on a computer system. Official notice is taken that a computer comprises a storage device, an output device, and a processor.*

Claim 63

Ndousse teaches the event-correlation system of claim 62, further comprising:

a memory to store the static and dynamic information. *Official notice is taken that a computer comprises a memory.*

CLAIM REJECTIONS - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

.Claims **19-21, 32, 40, and 59-61** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ndousse as applied to claims 1-18, 22-31, 33-39, 41-58, and 62-63 above, in view of "Contextual Fuzzy Cognitive Map for Decision Support in Geographic Information Systems" by Zhi-Qiang Liu et al, hereinafter Liu, and further in view of "Cognitive maps and fuzzy implications" by Thierry Marchant, hereinafter Marchant.

Claim 19

Ndousse discloses substantially all of appellant's claimed invention with the exception of the computation of an indirect effect of events.

Liu teaches the computation of an indirect effect on concepts in an FCM using the claimed equation.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify Ndousse as taught by Liu.

The motivation for doing so would be "for decision support based on the degree to which one concept affects another" (Liu, page 502, right col., paragraph IV, lines 2, 12-13).

Liu does not expressly disclose the computation of the bounded difference.

Marchant teaches the computation of the bounded difference using the claimed equation which is the fuzzy equivalents of the AND logical connective of two sets.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to combine Ndousse and Liu as taught by Marchant.

The motivation for doing so would be "*in order to find what are the elements of a system on which we eventually could act in order to modify the system based on the bound and domain*" (*Marchant, page 634, right col., paragraph 7.1, lines 15-18*).

The method of claim 3, wherein evaluating the effect of the received event nodes on the concept nodes, comprises:

computing an indirect effect of events (predictive event-correlation) on concept nodes using the equations:

$$I_{px}(E_i, C_j) = \min(e_{px}(E_i, C_j)) = \min(e_{px_{r1}}(E_i, E_k)) \oplus \ldots\ldots \oplus \min(e_{px_{rn}}(E_{km}, C_j))$$

(*Liu, page 504, right col., lines 10-28*)

wherein the indirect effect of events E_i on concept nodes C_i can be defined as the intersection of the linked causal types and can be described by the above equation, e_{px} is a function which takes I_{ij} to [0,1] in path 'p' i.e. $e_{Iij} = f \rightarrow (I_{ij}, \mu_{ij})$, $\mu_{ij} \in \{0,1\}$, and $\oplus$ represents a concatenation of paths, wherein the concatenation operator $\oplus$ is generally considered as a fuzzy 'and' operator, wherein the operator (t-norm) for intersection of two fuzzy sets other than 'min' can be used using a 'bounded difference', wherein the bounded difference can be computed using the equation:

$$t_1(\mu_A(x), \mu_B(x)) = \max\{0, \mu_A(x) + \mu_B(x) - 1\}$$

wherein $t_1()$ is a t-norm between fuzzy sets A and B with membership functions μ_A and μ_B.

Claim 20

The method of claim 19, wherein mapping the received real-time events to the formed FCM fragments comprises:

correlating the received events to the identified concept nodes to evaluate the effect of the received event nodes on the identified concept nodes using the determined element interdependencies (*Ndousse, page 1559, Figure 2*).

Claim 21

The method of claim 20, wherein correlating the received events to the concept nodes further comprises:

accumulating evidence based on the received event nodes (*Ndousse, page 1559, right col.*);

comparing the accumulated evidence to a threshold value (*Ndousse, page 1559, right col.*); and

analyzing the concept nodes based on the outcome of the comparing to evaluate the effect of the received event nodes (*Ndousse, page 1559, right col.*).

Claim 32

The computer readable medium of claim 27, wherein evaluating the effect of the received event nodes on the concept nodes, comprises:

computing an indirect effect of events on concept nodes using the equation:

$$I_{px}(E_i, C_i) = \min(e_{px}(E_i, C_j)) = \min(e_{px_{r1}}(E_i, E_k)) \oplus \ldots\ldots \oplus \min(e_{px_{m}}(E_{km}, C_j))$$

(*Liu, page 504, right col., lines 10-28*)

wherein the indirect effect of events E_i on concept nodes C_i can be defined as the intersection of the linked causal types and can be described by the above equation, e_{px} is a function which takes I_{ij} to [0,1] in path 'p' i.e. $e_{Iij} = f \rightarrow (I_{ij}, \mu_{ij})$, $\mu_{ij} \in \{0,1\}$, and $\oplus$ represents a concatenation of paths, wherein the concatenation operator $\oplus$ is generally considered as a fuzzy 'and' operator, wherein the operator (t-norm) for intersection of two fuzzy sets other than 'min' can be used using a 'bounded difference', wherein the bounded difference can be computed using the equation:

$$t_1(\mu_A(x), \mu_B(x)) = \max\{0, \mu_A(x) + \mu_B(x) - 1\}$$

wherein $t_1()$ is a t-norm between fuzzy sets A and B with membership functions μ_A and μ_B.

Claim 40

The system of claim 35, wherein evaluating the effect of the received event nodes on the concept nodes, comprises:

computing an indirect effect of events on concept nodes using the equation:

$$I_{px}(E_i, C_i) = \min(e_{px}(E_i, C_j)) = \min(e_{px_{r1}}(E_i, E_k)) \oplus \ldots\ldots \oplus \min(e_{px_m}(E_{km}, C_j))$$

(*Liu, page 504, right col., lines 10-28*)

wherein the indirect effect of events E_i on concept nodes C_i can be defined as the intersection of the linked causal types and can be described by the above equation, e_{px} is a function which takes I_{ij} to [0,1] in path 'p' i.e. $e_{Iij} = f \rightarrow (I_{ij}, \mu_{ij})$, $\mu_{ij} \in \{0,1\}$, and $\oplus$ represents a concatenation of paths, wherein the concatenation operator $\oplus$ is generally considered as a fuzzy 'and' operator, wherein the operator (t-norm) for intersection of

two fuzzy sets other than 'min' can be used using a 'bounded difference', wherein the bounded difference can be computed using the equation:

$$t_1(\mu_A(x), \mu_B(x)) = \max\{0, \mu_A(x) + \mu_B(x) - 1\}$$

wherein $t_1()$ is a t-norm between fuzzy sets A and B with membership functions μ_A and μ_B.

Claim 59

The event-correlation system of claim 43, wherein the analyzer evaluates an indirect effect of events on concept nodes using the equations:

$$I_{px}(E_i, C_j) = \min(e_{px}(E_i, C_j)) = \min(e_{px_{r1}}(E_i, E_k)) \oplus \ldots\ldots \oplus \min(e_{px_m}(E_{km}, C_j))$$

(*Liu, page 504, right col., lines 10-28*)

wherein the indirect effect of events E_i on concept nodes C_j can be defined as the intersection of the linked causal types and can be described by the above equation, e_{px} is a function which takes l_{ij} to [0,1] in path 'p' i.e. $e_{lij} = f \rightarrow (l_{ij}, \mu_{ij})$, $\mu_{ij} \in \{0,1\}$, and $\oplus$ represents a concatenation of paths, wherein the concatenation operator $\oplus$ is generally considered as a fuzzy 'and' operator, wherein the operator (t-norm) for intersection of two fuzzy sets other than 'min' can be used using a 'bounded difference', wherein the bounded difference can be computed using the equation:

$$t_1(\mu_A(x), \mu_B(x)) = \max\{0, \mu_A(x) + \mu_B(x) - 1\}$$

wherein $t_1()$ is a t-norm between fuzzy sets A and B with membership functions μ_A and μ_B.

Claim 60

The event-correlation system of claim 59, wherein the analyzer maps the received real-time events to the formed FCM fragments by correlating the received events to the identified concept nodes to evaluate the effect of the received event nodes on the identified concept nodes using the determined element interdependencies (*Ndousse, page 1559, Figure 2*).

Claim 61

The event-correlation system of claim 59, wherein the analyzer correlates the received events by accumulating evidence based on the received event nodes and compares the accumulated evidence to a threshold value, and analyzes the concept nodes based on the outcome of the comparing to evaluate the effect of the received event nodes (*Ndousse, page 1559, right col.*)

(10) Response to Argument

1. **Rejection of claims 1-18, 22-31, 33-39, 41-58, and 62-63 under 35 U.S.C. § 102(b):**

Argument 1

In re pg. 11, appellant argues independent claims 1, 25, and 33 recite "sampling generated incoming real-time events from the system." Independent claim 41 also samples generated incoming real time events. No mention of such sampling is found in the reference.

In response, the examiner disagrees. Ndousse discloses sampling (the process or technique of obtaining a representative sample, e.g., determing a set of faults, pg. 1558, last paragraph, as opposed to collecting 100% of all data or all fault data) generated incoming real-time (not further defined, and is a relative term; see e.g. conclusion) events from the system. Also, if the appellant is arguing that no sampling takes place, then is the appellant also arguing Ndousse discloses collecting 100% of all fault data?

Appellant is reminded that during patent examination Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. E-Pass Techs., Inc. v. 3Com Corp., 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (claims must be interpreted "in view of the specification" without importing limitations from the specification into the claims unnecessarily). In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969).

Ndousse teaches *"Fault management of robust network management" (page 1558, left col., paragraph I, lines 2-3)*. The Examiner submits that the concept "Fault management" is well known to those skilled within the art of Networking. More specifically, as described in the Wikipedia Online Encyclopedia (http://en.wikipedia.org/wiki/Fault_management):

> In network management, fault management is the set of functions that detect, isolate, and correct malfunctions in a telecommunications network, compensate for environmental changes, and include maintaining and examining error logs, accepting and acting on error detection notifications, tracing and identifying faults, carrying out sequences of diagnostics tests, correcting faults, reporting

> error conditions, and localizing and tracing faults by examining and manipulating database information.
> When a fault or event occurs, a network component will often send a notification to the network operator using a protocol such as SNMP. An alarm is a persistent indication of a fault that clears only when the triggering condition has been resolved. A current list of problems occurring on the network component is often kept in the form of an active alarm list such as is defined in RFC 3877, the Alarm MIB.

In other words, to be able to perform fault management, a fault or event or notification or message sent from the network will need to be collecting, gathering, storing, or ***sampling*** as Appellant argued.

On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS (emphasis added).

Argument 2

> In re pg. 12, the appellant argues the claims also utilize a computer to form the fuzzy cognitive maps, expressly in claims 25 and 33, and by implication in claims 1 and 41, since they sample system generated real-time events and map the sampled events to diagnose problems. This would simply be impossible to do in real time by an expert, or within a time frame acceptable for diagnosing problems. In Ndousse et al., FCMs are constructed by experts, not by a computer.

In response, the appellant is invited to provide the documentation that supports his position that it would simply be impossible to do in real time by an expert, or within a time frame acceptable for diagnosing problems.

In response to appellant's assertion that in Ndousse et al., FCMs are constructed by experts, not by a computer, is the appellant also arguing that an "expert" is doing these calculations by hand without any form of a computer including a calculator?

It should be noted that this argument was only brought up after a Final Office Action was mailed out.

Appellant is being confused when argued that in Ndousse, FCMs are constructed by experts, not by a computer. Ndousse teaches *"**Computational Intelligence** for Distributed Fault Management in Networks Using Fuzzy Cognitive Maps" (title), a* ***computationally based expert system*** *(abstract).* Ndousse further clarifies "*traditional expert systems with symbolic knowledge representation implemented with "IF/THEN" conditional statements require complicated and lengthy matching schemes, to slow for real-time systems such as networks" (page 1158, left col., lines 40-43).* Ndousse teaches *"Fuzzy Expert Systems" (page 1558, right col., lines 1-6), and also teaches* ***"the computational*** *capability of the FCM as* ***an expert system*** *makes it an alternative to the rule-based systems which are too slow for real-time applications" (page 1562, right col., lines 15-18).*

On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS (emphasis added).

Argument 3

> In re pg. 13, the appellant argues claims 1, 25, and 33 also distinguish from Ndousse et al., in that the FCM fragments are formed. The Office Action cites page 1559, left col., lines 36-37 of Ndousse et al., as describing this feature. However, that language does not appear to describe the creation of the FCM fragments, but merely describes that "the FCM denote faulty managed objects or concepts, while the arcs denote fault propagation between managed objects or network fault concepts." This is clearly not describing how to create an FCM fragment, but only what it represents. Claims 1, 25, and 33 describe how to create one using computer elements. Still further, no mention in Ndousse et al, was found regarding the use of event notifications that convey the state of one or more managed objects to create FCM fragments as claimed.

In response to appellant's argument that "this is clearly not describing how to create an FCM fragment, but only what it represents", there is no mention of these

limitations in the claims and the specification is not the measure of the invention. Therefore, limitations contained therein can not be read into the claims for the purpose of avoiding the prior art; see In re Sprock, 55 CCPA 743, 386 F.2d 924, 155 USPQ 687 (1968).

In response to appellant's argument that no mention in Ndousse et al, was found regarding the use of event notifications that convey the state of one or more managed objects to create FCM fragments, the examiner strongly disagrees. Clearly Ndousse does disclose the use of event notifications (e.g., fault notifications, pg. 1558, last paragraph) that convey the state of one or more managed objects (e.g., last two lines under Fig. 5) to create FCM fragments (pgs. 1558-1561, especially).

It should be noted that this argument was only brought up after a Final Office Action was mailed out.

Appellant is reminded that during patent examination Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. E-Pass Techs., Inc. v. 3Com Corp., 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (claims must be interpreted "in view of the specification" without importing limitations from the specification into the claims unnecessarily). In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969).

On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS (emphasis added).

Argument 4

> In re pg. 13, the appellant argues claim 1 distinguishes Ndousse et al, in at least two respects, either of which is sufficient to reverse the rejection. First, claim 1 clearly indicates that incoming real-time events from the system are sampled, and the sampled events are used to form the FCM fragments. Second, the FCM fragments are constructed by a computer in claim 1 at least by implication. Ndousse et al, does not describe either limitation ...
> Thus, claim 1 clearly distinguishes from Ndousse et al, in that the FCMs are computer generated. The Office Action cites page 1559, left col., lines 36-37 of Ndousse et al, as describing this feature. However, that language does not appear to describe the creation of the FCM fragments, but merely describes that "the FCM denote faulty managed objects or concepts, while the arcs denote fault propagation between managed objects or network fault concepts." This is clearly not describing how to create an FCM, but only what it represents. Claim 1 describes how to create one. Still further, no mention in Ndousse et al, was found regarding the use of event notifications that convey the state of one or more managed objects to create FCM fragments as claimed.

Again, Appellant is reminded that during patent examination Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. E-Pass Techs., Inc. v. 3Com Corp., 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (claims must be interpreted "in view of the specification" without importing limitations from the specification into the claims unnecessarily). In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969).

First, in response, the examiner disagrees. Ndousse discloses sampling (the process or technique of obtaining a representative sample, e.g., determing a set of faults, pg. 1558, last paragraph, as opposed to collecting 100% of all data or all fault data) generated incoming real-time (not further defined, and is a relative term; see e.g. conclusion) events from the system. Also, if the appellant is arguing that no sampling

takes place, then is the appellant also arguing Ndousse discloses collecting 100% of all fault data?

Ndousse teaches *"Fault management of robust network management" (page 1558, left col., paragraph I, lines 2-3)*. The Examiner submits that the concept "Fault management" is well known to those skilled within the art of Networking. More specifically, as described in the Wikipedia Online Encyclopedia (http://en.wikipedia.org/wiki/Fault_management):

> In network management, fault management is the set of functions that detect, isolate, and correct malfunctions in a telecommunications network, compensate for environmental changes, and include maintaining and examining error logs, accepting and acting on error detection notifications, tracing and identifying faults, carrying out sequences of diagnostics tests, correcting faults, reporting error conditions, and localizing and tracing faults by examining and manipulating database information.
> When a fault or event occurs, a network component will often send a notification to the network operator using a protocol such as SNMP. An alarm is a persistent indication of a fault that clears only when the triggering condition has been resolved. A current list of problems occurring on the network component is often kept in the form of an active alarm list such as is defined in RFC 3877, the Alarm MIB.

In other words, to be able to perform fault management, a fault or event or notification or message sent from the network will need to be collecting, gathering, storing, or ***sampling*** as Applicants argued. On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS (emphasis added).

<u>Second</u>, in response to appellant's assertion that in Ndousse et al., FCMs are constructed by experts, not by a computer, is the appellant also arguing that an "expert" is doing these calculations by hand without any form of a computer including a calculator?

Ndousse teaches *"**<u>Computational Intelligence</u>** for Distributed Fault Management in Networks Using Fuzzy Cognitive Maps" (title), a **<u>computationally based expert system</u>** (abstract).* Ndousse further clarifies "*traditional expert systems with symbolic knowledge representation implemented with "IF/THEN" conditional statements require complicated and lengthy matching schemes, to slow for real-time systems such as networks" (page 1158, left col., lines 40-43).* Ndousse teaches *"Fuzzy Expert Systems" (page 1558, right col., lines 1-6), and also teaches **<u>"the computational</u>** capability of the FCM as **<u>an expert system</u>** makes it an alternative to the rule-based systems which are too slow for real-time applications" (page 1562, right col., lines 15-18).* On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS (emphasis added).

<u>Third</u>, in response to appellant's argument that "this is clearly not describing how to create an FCM fragment, but only what it represents", there is no mention of these limitations in the claims and the specification is not the measure of the invention. Therefore, limitations contained therein can not be read into the claims for the purpose of avoiding the prior art; see <u>In re Sprock</u>, 55 CCPA 743, 386 F.2d 924, 155 USPQ 687 (1968).

In response to appellant's argument that no mention in Ndousse et al, was found regarding the use of event notifications that convey the state of one or more managed objects to create FCM fragments, the examiner strongly disagrees. Clearly Ndousse does disclose the use of event notifications (e.g., fault notifications, pg. 1558, last

paragraph) that convey the state of one or more managed objects (e.g., last two lines under Fig. 5) to create FCM fragments (pgs. 1558-1561, especially).

On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS (emphasis added).

Argument 5

In re pg. 14, the appellant argues claim 2 depends from claim 1 and recites determining event nodes and concept nodes from determined event nodes. The FCM fragments, including interdependencies between the concept and event nodes are formed using the determined event nodes and the concept nodes. Ndousse et al., in the portion cited by the Examiner: page 1559, left col., lines 41-42 describe the nodes as being representative of objects and concepts, not events and concepts as claimed. The cited language describes edges joining objects, and then indicates that the casual strength is based on the knowledge of network experts. This actually confirms the premise that the FCM in Ndousse et al., is created by an expert, not by a computer system as claimed. Further, the language describes the content of an FCM, not how it is made as claimed. While including concept nodes, it lacks a description of identifying concept nodes from the event nodes as claimed. Thus, Ndousse et al., functions entirely different from the operation of claim 2. The Examiner also points to page 1560 and the paragraph under Figure 5. This paragraph further recites that concept nodes represent network managed objects. Again, this is different than the event nodes of claim 2. While Ndousse et al., mentions faults, such faults are not equated to events, and further no "fault nodes" appear to be formed (emphasis added).

It should be noted that this argument was only brought up after a Final Office Action was mailed out.

Appellant is reminded that during patent examination Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. E-Pass Techs., Inc. v. 3Com Corp., 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (claims must be interpreted "in view of the specification" without

importing limitations from the specification into the claims unnecessarily). In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969).

First, in response to appellant's assertion that Ndousse teaches the nodes as being representative of objects and concepts, not events and concepts as claimed. Although Appellant can be his own lexicographer, however, since the term "event" was not further define in the claims, the applied art still reads on it. The Examiner asserts **event nodes** simply read on literal events; in a network management or fault management system, an event can be a notification that something is wrong or that some type of failure occurred, see e.g., fault propagation, pgs. 1558-1559), and **concept nodes** (concepts, pg. 1559, lines 34-41 read on decision points in the FCM, Fig. 2; see also concept nodes, under Fig. 5, pg. 1560).

On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS (emphasis added).

Second, in response to appellant's assertion that in Ndousse et al., FCMs are constructed by experts, not by a computer, is the appellant also arguing that an "expert" is doing these calculations by hand without any form of a computer including a calculator?

Ndousse teaches *"**Computational Intelligence** for Distributed Fault Management in Networks Using Fuzzy Cognitive Maps" (title)*, a ***computationally based expert system*** *(abstract)*. Ndousse further clarifies "*traditional expert systems with symbolic knowledge representation implemented with "IF/THEN" conditional statements require complicated and lengthy matching schemes, to slow for real-time*

systems such as networks" (page 1158, left col., lines 40-43). Ndousse teaches *"Fuzzy Expert Systems" (page 1558, right col., lines 1-6), and also teaches* ***"the computational*** *capability of the FCM as* ***an expert system*** *makes it an alternative to the rule-based systems which are too slow for real-time applications" (page 1562, right col., lines 15-18).*

On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS (emphasis added).

Third, in response to appellant's assertion that while including concept nodes, it lacks a description of identifying concept nodes from the event nodes as claimed. The Examiner asserts **identifying concept nodes** (concepts, pg. 1559, lines 34-41 read on decision points in the FCM, Fig. 2; see also concept nodes, under Fig. 5, pg. 1560) **from the determined event nodes** (see how the concepts are determined from the actual events of a fault occurring, see "Models of Fault Propagation, *pgs. 1559-1599, especially pg. 1559, left col., lines 41-42, or pg. 1560, paragraph under Figure 5*).

On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS (emphasis added).

Fourth, mere conclusory statement such as "while Ndousse et al. mentions faults, such faults are not equated to events" does not convey the applicants' rationale such that the Examiner can respond in a meaningful manner. The Examiner gives this limitation "event" of Appellant the broadest reasonable interpretation as "fault" of Ndousse (page 118, right col., last 4 lines) and "fault nodes" or "event nodes" the Examiner asserts event nodes simply read on literal events; in a network management

or fault management system, an event can be a notification that something is wrong or that some type of failure occurred, see e.g., fault propagation, pgs.. 1558-1559). Besides, as specifically described in the Wikipedia Online Encyclopedia (http://en.wikipedia.org/wiki/Fault_management):

> In network management, fault management is the set of functions that detect, isolate, and correct malfunctions in a telecommunications network, compensate for environmental changes, and include maintaining and examining error logs, accepting and acting on error detection notifications, tracing and identifying faults, carrying out sequences of diagnostics tests, correcting faults, reporting error conditions, and localizing and tracing faults by examining and manipulating database information.
> **When a fault or event occurs,** a network component will often send a notification to the network operator using a protocol such as SNMP. An alarm is a persistent indication of a fault that clears only when the triggering condition has been resolved. A current list of problems occurring on the network component is often kept in the form of an active alarm list such as is defined in RFC 3877, the Alarm MIB (emphasis added).

On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS (emphasis added).

Argument 6

> In re pg. 15 claim 3 depends from claim 2 and distinguishes the reference for at least the same reasons. Further, claim 3 recites mapping sampled real-time events to the formed FCM fragments. The Examiner indicates this is disclosed in Figure 2 on page 1559. However, Figure 2 illustrates fault propagation using managed object nodes, and not events. Events, as claimed, do not appear to play a role in the FCM fragments of Ndousse et al, and the rejection should be reversed.

Figure 2 on page 1559 not only illustrates managed object nodes but faults also which equated to "events" of Applicants. Ndousse teaches "*Denote with* $\{f_1, f_2, f_3, \ldots, f_m\}$ *the set of faults or network conditions that could potentially be generated by a typical managed object. We write* $f_n(e_{ij})$ *to represent the propagation of fault* f_n *generated by the managed object* A_i *which propagates to the adjacent object* A_j*. The quantity* $f_n(e_{ij})$*,*

encodes expert knowledge and is therefore considered a form of knowledge representation. For simplicity, we prefer to use e_{ij} instead of $f_n(e_{ij})$ to represent the causal relationship between the operational condition of managed object A_i on the adjacent object A_j" (page 1558, right col., last 4 lines, page 1559, left col., lines 1-6).

On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS.

Argument 7

In re pg. 15 claim 11 depends from claim 3 and distinguishes the references for at least the same reasons. Further, claim 11 recites that the incoming events are sampled sequentially in order they are received. The Examiner references page 1558, left col., lines 5-8 of Ndousse et al, as describing this element. However, the cited text merely refers to time-varying aspects, and no mention of events, real-time events, or sampling is found in Ndousse et al..

In response to Appellant's argument, Ndousse teaches sampling incoming real-time (not further defined) events from the system (see e.g., time varying aspects, abstract; fault management, rapid solution, and/or very rapid detection, *page 1558, left col., lines 5-36, paragraph I, lines 2-3*).

In response, the examiner disagrees. Ndousse discloses sampling (the process or technique of obtaining a representative sample, e.g., determing a set of faults, pg. 1558, last paragraph, as opposed to collecting 100% of all data or all fault data) generated incoming real-time (not further defined, and is a relative term; see e.g. conclusion) events from the system. Also, if the appellant is arguing that no sampling takes place, then is the appellant also arguing Ndousse discloses collecting 100% of all fault data?

On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS.

<u>Argument 8</u>

> In re pg. 16 claim 12 depends from claim 3 and distinguishes the reference for at least the same reasons. Further, claim 12 recites identifying a composite set of events that capture the notion of an abstract exception condition in the network. The Examiner cites Figure 5 on page 1560 as describing this element. However, Figure 5 refers to the aggregation of FCMs from multiple experts. It is not seen how it is representative of a composite set of events as claimed.

In response to Appellant's assertion that Figure 5 is not seen how it is representative of a composite set of events, the Examiner asserts Figure 5 on page 1560 illustrates the augmented FCM of two experts. This is how Ndousse puts it "The FCM show in figures 2 and 4 can be aggregated to form single augmented FCM shown in Figure 5". The FCM shown in Figure 2 illustrates one set of events, the FCM shown in Figure 4 illustrates another set of events.

On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS.

<u>Argument 9</u>

> In re pg. 16 claim 22 distinguishes Ndousse et al, in that it clearly indicates that incoming real-time events from the system are sampled, and the sampled events are used to form the FCM fragments ... This language fails to describe sampling, and a review of Ndousse et al, reveals <u>no mention of sampling</u>. Still further, <u>no mention of events</u> is found (emphasis added).

Appellant is reminded that during patent examination Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re

Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. E-Pass Techs., Inc. v. 3Com Corp., 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (claims must be interpreted "in view of the specification" without importing limitations from the specification into the claims unnecessarily). In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969).

In response, the examiner disagrees. Ndousse discloses sampling (the process or technique of obtaining a representative sample, e.g., determing a set of faults, pg. 1558, last paragraph, as opposed to collecting 100% of all data or all fault data) generated incoming real-time (not further defined, and is a relative term; see e.g. conclusion) events from the system. Also, if the appellant is arguing that no sampling takes place, then is the appellant also arguing Ndousse discloses collecting 100% of all fault data?

Ndousse teaches *"Fault management of robust network management" (page 1558, left col., paragraph I, lines 2-3)*. The Examiner submits that the concept "Fault management" is well known to those skilled within the art of Networking. More specifically, as described in the Wikipedia Online Encyclopedia (http://en.wikipedia.org/wiki/Fault_management):

> In network management, fault management is the set of functions that detect, isolate, and correct malfunctions in a telecommunications network, compensate for environmental changes, and include maintaining and examining error logs, accepting and acting on error detection notifications, tracing and identifying faults, carrying out sequences of diagnostics tests, correcting faults, reporting error conditions, and localizing and tracing faults by examining and manipulating database information.
> When a fault or event occurs, a network component will often send a notification to the network operator using a protocol such as SNMP. An alarm is a persistent indication of a fault that clears only when the triggering condition has been resolved. A current list of problems occurring on the network component is often

> kept in the form of an active alarm list such as is defined in RFC 3877, the Alarm MIB.

In other words, to be able to perform fault management, a fault or event or notification or message sent from the network will need to be collecting, gathering, storing, or ***sampling*** as Applicants argued. On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS (emphasis added).

Moreover, Ndousse teaches <u>events</u> from the system (see e.g., time varying aspects, abstract; fault management, rapid solution, and/or very rapid detection, *page 1558, left col., lines 5-36, paragraph I, lines 2-3*).

On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS.

<u>Argument 10</u>

> In re pg. 17 claim 23 depends from claim 22 and recites determining event nodes and concept nodes from determined event nodes. The FCM fragments, including interdependencies between the concept and event nodes are formed using the determined event nodes and the concept nodes. Ndousse et al., in the portion cited by the Examiner: page 1559, left col., lines 41-42 describe the nodes as being representative of <u>objects and concepts, not events and concepts as claimed</u>. Thus, Ndousse et al, functions entirely different from the operation of claim 23. The Examiner also points to page 1560 and the paragraph under Figure 5. This paragraph further recites that concept nodes represent network managed objects. Again, this is different than the event nodes of claim 23.

It should be noted that this argument was only brought up after a Final Office Action was mailed out.

Appellant is reminded that during patent examination Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997).

Limitations appearing in the specification but not recited in the claim are not read into the claim. E-Pass Techs., Inc. v. 3Com Corp., 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (claims must be interpreted "in view of the specification" without importing limitations from the specification into the claims unnecessarily).. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969).

In response to appellant's assertion that Ndousse teaches the nodes as being representative of objects and concepts, not events and concepts as claimed. Although Appellant can be his own lexicographer, however, since the term "event" was not further define in the claims, the applied art still reads on it. The Examiner asserts **event nodes** simply read on literal events; in a network management or fault management system, an event can be a notification that something is wrong or that some type of failure occurred, see e.g., fault propagation, pgs. 1558-1559), and **concept nodes** (concepts, pg. 1559, lines 34-41 read on decision points in the FCM, Fig. 2; see also concept nodes, under Fig. 5, pg. 1560).

On this basis, Examiner asserts Ndousse anticipated the argued limitation. Therefore, the rejection STANDS (emphasis added).

Argument 11

Claim 25 is a computer readable medium version of claim 1, and is rejected as above.

Argument 12

Claim 33 and claim 41 are argued in a manner similar to that described with respect to claim 1 and are responded in Argument 4.

Argument 13

Claim 42 is argued in a manner similar to that described with respect to claim 2 and claim 23 and is responded in Argument 5 and Argument 10.

Argument 14

Claim 43 is argued in a manner similar to that described with respect to claim 3 and is responded in Argument 6.

Examiner maintains the rejection as Ndousse does teach each and every element of the invention as claimed.

2. **Rejection of claims 19-21, 32, 40, and 59-61 under U.S.C. § 103(a)**: as being unpatentable over Ndousse as applied to claims 1-18, 22-31, 33-39, 41-58, and 62-63 above, in view of "Contextual Fuzzy Cognitive Map for Decision Support in Geographic Information Systems" by Zhi-Qiang Liu et al, hereinafter Liu, and further in view of "Cognitive maps and fuzzy implications" by Thierry Marchant, hereinafter Marchant.

Argument 15

In re pg. 19 claim 19 depends from claim 3 and is believed allowable for at least the same reasons. Further, claim 19 recites evaluating the effect of the received event nodes on the concept nodes. The references, alone or combined do not recite the use of event nodes in a method to diagnose problems in a system of managed components. The Examiner indicates that Liu teaches the computation of an indirect effect of concepts in an FCM using the claimed equation. Even if that were the case, it does not provide the missing use of event nodes of the present claim. Marchant is not cited as teaching, disclosing or suggesting the use of event nodes either. Thus, there is no teaching or suggestion of the use of event nodes, and the rejection should be reversed.

In response to appellant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In this case, the motivation to combine Ndousse as taught by Liu is "for decision support based on the degree to which one concept affects another" (Liu, page 502, right col., paragraph IV, lines 2, 12-13) and the motivation to combine Ndousse and Liu as taught by Marchant is "in order to find what are the elements of a system on which we eventually could act in order to modify the system based on the bound and domain" (Marchant, page 634, right col., paragraph 7.1, lines 15-18).

Argument 16

In re pg. 19 claims 20 and 21 depend from claim 19. They describe the use of real time events to evaluate the effect of the received events on identified concept nodes. This is a form of dynamically changing the FCM fragments with time and the discovery of new concepts and events. This concept is not

> disclosed in Ndousse et al, at the cited right column of page 1559. Since an expert is used in Ndousse et al to create the FCM, it would require the expert to continuously monitor real time traffic and change the model on the fly.

In response to appellant's argument that "this is a form of dynamically changing the FCM fragments with time and the discovery of new concepts and events.' This concept is not disclosed in Ndousse et al" there is no mention of these limitations in the claims and the specification is not the measure of the invention. Therefore, limitations contained therein can not be read into the claims for the purpose of avoiding the prior art; see In re Sprock, 55 CCPA 743, 386 F.2d 924, 155 USPQ 687 (1968).

In response, the appellant is invited to provide the documentation that supports his position that it would require the expert to continuously monitor real time traffic and change the model on the fly.

As repeatedly responded above, Ndousse teaches *"**Computational Intelligence** for Distributed Fault Management in Networks Using Fuzzy Cognitive Maps" (title), a* ***computationally based expert system*** *(abstract)*. Ndousse further clarifies "*traditional expert systems with symbolic knowledge representation implemented with "IF/THEN" conditional statements require complicated and lengthy matching schemes, to slow for real-time systems such as networks" (page 1158, left col., lines 40-43)*. Ndousse teaches *"Fuzzy Expert Systems" (page 1558, right col., lines 1-6), and also teaches **"the computational** capability of the FCM as **an expert system** makes it an alternative to the rule-based systems which are too slow for real-time applications" (page 1562, right col., lines 15-18).*

Argument 17

Claim 32, claim 40, claim 59, claims 60 and 61 are argued in a manner similar to that described with respect to claim 19 and is responded in Argument 15.

Examiner maintains the rejection as Ndousse, in view of Liu, and further in view of Marchant do teach each and every element of the invention as claimed.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Mai T. Tran

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Conferees:

David Vincent 4/30/07

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